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ABSTRACT

Issues of meaning have become central concerns of research on language development. There are at least four reasons for the neglect of meaning by earlier researchers. First, Chomsky's original theory assumed that syntax could be described and explained independently of meaning. Second, linguists had long assumed that semantics was too messy and difficult to get involved in. Third, psychologists viewed semantics as too easy and transparent. Fourth, issues of meaning, as defined in adopted philosophical models, seemed to psychologists and linguists to be too remote from the problems faced by the language-learning child. This paper: (1) indicates how each of these four reasons for neglect gave way in the light of new research; (2) sketches some recent approaches that address lexical meaning as a problem in its own right; and (3) describes a framework considered appropriate for further research into the process of how language is learned and the question of how word meanings and concepts relate to each other. The general approach described constitutes a functional framework for conceptual and semantic development, one that is based on the assumption that the child's mind is a system that is open to the potential and constraints of the social, cultural, and communicative world in which the child develops. (RH)

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MEANING THE MISSING PIECE

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The 1961 Dedham Conference focused on what seemed then to be the most mysterious and significant aspect of the Acquisition of Language: how the child began to acquire grammatical structure. Although meaning was not entirely missing from the discussions, it was mostly hidden in the wings.

Today issues of meaning, both in relation to grammatical development and in relation to lexical growth, have become hot topics. Why was meaning missing in 1961 and what happened to bring it into focus in 1989? There are at least 4 reasons for its early neglect I think. First, Chomsky's original theory assumed that syntax could be described and explained independently of meaning; meaning would emerge from structure. This stance led to the assumption adopted by most participants in the Dedham Conference that the important issues in child language could be studied without reference to content or message and that the child could learn grammatical structure independently of semantic force.

The second reason derived from the long-held assumption in linguistics, articulated by Bloomfield, that semantics was too messy and difficult for linguists to get involved in. Semantics required relating linguistic forms to the real world, which inevitably would bring in an unmanageably large set of problems beyond the scope of linguistic methods. Third, in contrast, from the psychological side semantics looked almost too easy, too transparent. Language development up to that point had been represented primarily by "counting studies," focusing on number of vocabulary words, or number and types of word associations. These studies seemed grossly superficial in the light of the new linguistics, and psychologists were eager to abandon them. Among the few references to meaning in the report of the conference was Chomsky's criticism of the notion implicitly adopted by psychologists that assignment of reference to lexical terms is transparent.

Finally, issues of meaning as they were currently defined in philosophical models, which had been adopted by interested psychologists and linguists, seemed too remote from the problems faced by the language learning child. Matters of truth and logical structure did not seem relevant to the first sentences of the one-year old.

In the time available I can hardly do justice to the developments that have taken place over the past 20 years that brought meaning into the limelight. Rather, I will briefly indicate how each of these reasons for neglect gave way in the light of new research, sketch some recent approaches that address lexical meaning as a problem in its own right, and end with a brief

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description of a framework that seems to me appropriate for further research into the problems of how we mean with words and how children come to mean.

Within a few years of the publication of the Dedham monograph it became clear that the assumption that child language could be studied without semantics was untenable. Bloom (1970) demonstrated that grammatical descriptions of children's two-word utterances necessarily depended upon interpretations of their intended meaning. With this break-through meaning burst into the study of and explanations of the acquisition of grammar (Bowerman 1973; Brown 1973) and has remained firmly in place since. This is the topic of other papers in this symposium and I will not pursue it further.

Semantics had also found its way into transformational grammar. The first move toward a theory of lexical meaning in the 1960's, following Chomsky's path, was taken by Katz and Fodor (1963), who proposed that the lexical component of the grammar was composed of combinations of a universal and innate fixed set of semantic markers. Componential analysis was not new to linguistics, but the Katz and Fodor model was an attempt to systematize and bring it into conformance with the principles of transformational grammar. A variation of the componential model based on universal semantic features was outlined by Bierwisch (1970), and served as the basis for Clark's (1973) influential "semantic feature hypothesis." Clark's paper representated a breakthrough from the "counting studies" of earlier child language research. Although focused on vocabulary growth, Clark's work dug deeper into meaning and the systematic relations among the meanings of words, opening the way for alternative systematic analyses of child meaning.

Clark suggested that children draw from the universal set of semantic components one or a few features at a time in acquiring their first words. Thus a child might take dog to mean "four-legged animal" having extracted the features /FOUR-LEGGED/ and /ANIMATE/ from the perceptual array evident when the word dog was used. Much research was generated during the 70's on the semantic feature proposal of lexical acquisition. By the early 80's, it had been subjected to attack from both theoretical and empirical directions, and it was largely abandoned in its original form by Clark herself (1983). But this abandonment raised the question: if word meanings are not composed of semantic features, how are they structured, and how does the child acquire them?

An early alternative suggestion was that children base their early meanings on pre-linguistic concepts, but this left open the question of how concepts are formed and structured. Until the early 70's the classic theory of concept structure implicitly accepted by most philosophers, psychologists, and linguists assumed that concepts are composed as logical combinations of separately necessary and jointly sufficient attributes. This model formed the basis for all of the work on concept formation and concept development up to that point. From this perspective young children, being logically deficient, are incapable of forming concepts. They are necessarily limited to pre-concepts that rest on prototypes and that confuse the whole with the part, as Piaget claimed.

Since 1973, beginning with Eleanor Rosch's pathbreaking work, the

psychology of concepts and categories, by a process at first slow and then explosive, has become a major issue in both cognitive and developmental psychology. Rosch's research implied that the internal structure of natural language categories was organized around prototypes, that categories had graded structure, with more central and more peripheral members, and that rather than being constituted in terms of logical combinations of separately necessary and jointly sufficient features, categories are structured in terms of family resemblances: overlapping features, none of which are either necessary nor sufficient. These findings implied further that young children were not different from older children and adults in their basic conceptual structure. Rather, human concepts at all ages seemed to be formed around central exemplars, or abstracted prototypical features, and although it was true that children's concepts lacked consistent logical structure so did adults'.

This "new look" in concepts and categories undermined the classic theory, and also implied that there is no one true concept or category but that different people might have different concepts for the same purported category, an implication reflected as well in contemporary work in linguistics (Labov 1973) and in philosophy (Putnam 1975) on word meanings. It has since come to be accepted that there is no one meaning for any word that all users have in their heads; that word meanings vary between users, over time within a community, and even over time by the same user.

My own early studies of children's word meanings (1973) had led to a proposal not inconsistent with Rosch's framework. I suggested that children formed concepts of objects based on object function and form, with function as the core of the concept and form its probabilistic periphery. The child's concepts were held to be derived from interaction with objects in the world that then became the basis for word meaning, with the first words mapped onto the already formed concepts. The word would then be generalized to other objects sharing form and function features. Although I was not concerned with prototypical structure of concepts (and it's not clear that this structure applies appropriately to the basic level), the probabilistic structure of the functional core concept was clearly more in line with the new look derived from Rosch's (and ultimately from Wittgenstein's) work than with the classic logical theory of conceptual structure.

Empirical tests of these ideas produced conflicting results. This is not the place to defend the claims. Research clearly showed that children do not prefer function to perceptual attributes as a basis for the extension of words to novel objects. Must we then conclude that function is irrelevant to their concepts? I think not, but I defer further discussion of the issue for the present.

Many theorists of concepts and categories now contend that the structure and content of concepts can only be explained in terms of the mental models or intuitive theories within which they are embedded. The central idea here is that concepts do not exist as singular items, but as part of a person's model of reality, which consists of many separate domains. The theory terminology implies an explanatory structure: elements are ordered in a theory in terms of causal relations. This way of thinking about concepts as unfixed elements

within larger cognitive constructions suggests many possibilities and has considerable appeal to many developmental psychologists, including myself. It can allow for open and changing minds as knowledge structures proliferate; it may account for the presence of the same concepts in more than one domain; and recognizing that theories are social and cultural constructions it can take account of the contribution of the social world to the individual's mental models.

While this approach seems to open up many possibilities, there is a competing contemporary framework that appears to close the mind off from the real world.

By 1975 Fodor had abandoned the effort to construct a theory of meaning based on semantic markers and proposed instead a radically different claim about the source of concepts and word meanings. His argument is essentially that concepts cannot be learned through a process of hypothesis testing, because in order to generate a hypothesis about what a word could mean, the concept must already be available in the "Language of Thought." Ergo, all concepts that may be acquired - whether as concrete as the concept hat (or telephone) or as abstract as the concept justice - must be initially built-in to the human mind. When the child learns a native language these innate concepts are "triggered" by environmental stimuli and the appropriate words are mapped onto them.

Although few developmentalists have followed Fodor into this extreme position, a number have been influenced by it and by related nativist ideas. In particular, a position that views "constraints" on the structure of knowledge in a delimited domain as necessary to the acquisition of all knowledge has served as the basis for a number of current proposals relevant to the acquisition of lexical meaning. There is now a considerable body of research with pre-school children that is aimed at determining what principles children use when they hear a novel word to "narrow down the indefinite number of possibilities" for the meaning of the word, or in the terms usually used, what constraints children place on the meanings of words. As one example, Clark's (1983; 1987) proposal claims that children base their assumptions about the meaning of words on two principles: (1) that words contrast in meaning; and (2) that there are conventional meanings. The contrastive principle is the most important of the two and has led to the most research. However, the research findings are not conclusive in showing that children are always constrained by the contrastive principle.

There are two ways of reading the developmental literature that claims constraints on word learning. One way is to follow the invited implication that basic universal innate characteristics of mind are being uncovered (as Fodor would claim). The second way is as a demonstration of the variety of clever (but often misleading) strategies or heuristics that children devise for figuring out what words mean (or for figuring out what experimenters mean in sometimes quite puzzling tasks). The theoretical import of this work is considerably lessened if the latter interpretation is taken as the appropriate one. In either case it should be noted that the claims here are about linguistic meaning, not concepts. The research suggests that these operate differently for young children.

Still, throughout the discussion up to this point I have used "concept" interchangeably with "word meaning," which accords with much usage in the psychological, linguistic and philosophical literature. However, there are reasons for distinguishing between the two, as Clark (1983) has insisted, and as the empirical work just referred to has shown. For one thing, unless one does distinguish concept and meaning there could be no pre-verbal or non-verbal concepts. Further, we could not account for the common feeling that one has an idea or a concept but cannot find the right words to put it into.

This raises the following questions: How do word meanings and concepts differ? How are they related? How are concepts structured? How are word meanings structured? How do these structures develop and relate to each other over time? In response to these questions I will summarize here very briefly the framework I have developed that I believe can help to address these issues.

I begin with the assumption that the conceptual system develops from infancy as a general knowledge system based on the child's experience in the world, including knowledge of its people, objects, spaces, and usual events. This knowledge becomes differentiated into packets that we call concepts. How and when these packets emerge from a possibly undifferentiated "presentation" is at present unknown, although there is some evidence that when the child first begins to learn words the packets are more global, less well articulated, than the word units of language require. It may indeed be that learning a language facilitates, perhaps is causal to, the articulation and stabilization of the naturally dynamic and highly relational conceptualization system. (cf. Bronowski and Bellugi 1970).

The basic idea here is that building a general knowledge system is not appropriately characterized in terms of picking out and combining features of the world and thus forming categories of objects and events; but rather in terms of forming a mental model of experienced reality in some considerable complexity. The model essentially represents relations between people and objects through time and space. To capture this notion I have put forth the construct of the <u>event representation</u> as a basic "packaging device" that incorporates knowledge of the significant people and events in the child's world and the objects that are embedded in them. What is represented and how depends upon what the important events are for the child, for example, feeding, caretaking routines, playful games, and so on. What aspects of these encounters enter into the representation again depends upon the functional significance of any given person, object, and action <u>from the child's point of view</u>.

This description seems quite consistent with the notion of concepts embedded in structured theories referred to earlier. However, I question whether the theory construct, which implies an encompassing explanatory structure, can be appropriately applied to the very young child's conceptual structures. Although event representations include goals and have causal connections between constituents, they are not in themselves explanatory. Rather, I see the small child making small causal connections among events, gradually building up <u>descriptive structures</u> which then may become the topic

of explanation, leading in time to more general explanatory structures (dependent in part on social and cultural knowledge sources) that could be characterized as theories.

There is nothing in this account of an experientially based conceptual system that guarantees that the child's mental models will map neatly onto words in the language being learned. Certainly languages vary greatly among themselves with respect to what meanings are lexicalized or grammaticized, and the child's first guesses at word meanings are often far from the mark. Somehow, the child must acquire a system of shared word meanings, that is, the child's ideas about what a word can refer to must come to coincide in important ways with the way the word is used by others in her linguistic community. At this point the child may begin to build a semantic structure that is differentiated from the underlying conceptual structure.

This is where I think Clark's (1983) claims about meaning contrasts come into play. When word meanings are established separately from the conceptual base core meanings of words are set up that distinguish one word's potential use from another related word. These distinctions form the basis for a system of contrasts, establishing relations of hyponymity, antonymy and synonymy, relations that clearly have psychological as well as linguistic reality. The claim here is that such relations emerge with development and are not the basis on which word meanings are learned to begin with.

The general approach sketched here constitutes a functional framework for conceptual and semantic development, based on the assumption that the child's mind is an open system - open to the potential and constraints of the social, cultural and communicative world in which the child develops.

As this brief and selective summary has indicated, a number of competing explanations of semantic development have been formulated to deal with what are now viewed as critical issues in language acquisition. Thus, in contrast to the situation 25 years ago, today issues of meaning have advanced close to, if they have not yet arrived at, the center stage of language development research.

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